

## REMARKS

The present application includes claims 1-12. Applicant thanks Examiner for the indication that claims 4-7 are allowable. Claims 1-3 and 8-12 stand rejected.

### **35 U.S.C 102(a) Rejection**

Claims 1-3 and 12 stand rejected under 35 U.S.C. 102(a) as anticipated by Scobey et al. (US 5,859,717) or Hardy (US 3,355,674) or Snitzer (US 3,395,331). The Examiner states that each of the references disclose a single mode optical fiber as an information transmission optical fiber, at least one index optical fiber having an outer diameter equal to the single mode optical fiber and having a lens function where the gradient index optical fiber is joined with the optical fiber.

With regard to claims 1-3, claim 1 has hereby been amended to include the feature of claim 4, which Examiner has stated is allowable. Therefore, this rejection of claims 1-3 is now moot. With respect to claim 12, Applicant respectfully disagrees with Examiner's assessment.

### **Scobey et al. (US 5,859,717)**

Scobey et al. disclose an optical multiplexing device. The device is capable of dispersing collimated multiwavelength light from a fiber-optic waveguide into individual channels. Conversely, the device may also be used to gather multiple wavelengths of light from individual sources and to multiplex them into a common fiber-optic waveguide. Examiner refers in particular to "columns 7-12" of the reference as presenting a description of the device that is anticipatory of the present invention. These columns of text describe the various embodiments of the invention that are depicted in Figures 2-6 of the application. With respect to Figures 2, 3, 5 and 6 (Figure 4 depicts a portion of the device that is unrelated to the present discussion), Applicant notes that the two elements of interest are elements 4 and 6. 4 and 6 are defined in column 8, at lines 12-15. Element 4 is an "optical fiber...carrying a multi-channel optical signal" which communicates with 6, a "means for projecting collimated light, such as a fiber-optic gradient index ('GRIN') lens". Applicant notes that element 6 is not limited to being a fiber-optic GRIN lens, and is repeatedly referred to simply as a "collimator 6" later in the patent, in column 12 at lines 47-48. With further reference to Figures 2, 3, 5 and 6, Applicant notes that elements 4

and 6 are, respectively, clearly depicted as a single line (4) connected to a cylinder (6) of much larger dimension than the single line. This is especially obvious in Figure 6, which shows an end view of their respective diameters. Thus, the two optical fibers of Scobey et al. are not of equal diameter.

In contrast, claim 12 of the present application provides a method of producing a “lens function-including optical fiber” which is composed of at least two parts: 1) at least one information transmission optical fiber and 2) at least one gradient index optical fiber. Further, the relationship between these two elements is clearly described as follows (see page 5, lines 5-9, and claim 1): the gradient index optical fiber has “an outer diameter equal to that of said information transmission optical fiber” and a “length exhibiting a specific lens function”. In addition, the gradient index optical fiber is “jointed or contacted” with an end surface of the information transmission optical fiber. The arrangement of the optical fibers is depicted in Figures 1-4, where the information transmission optical fiber is 2a and the gradient index optical fiber is 1a. As can be seen, the two fibers as shown are in direct contact and have equal diameters. The features of the lens-function including optical fiber of the present invention are thus clearly distinguishable from the device of Scobey et al., which includes an optical fiber connected to a collimator (which may be a fiber-optic GRIN lens) with a considerably larger diameter. In fact, this difference in diameter causes problems that the present invention is designed to overcome, namely that an exclusive use holder must be provided to accommodate the two disparate dimensions. (See Background section of the specification of the present invention, page 3, paragraph beginning at line 13.) Scobey et al. neither illustrate nor discuss a method of producing the lens function-including optical fiber of claim 12, and thus do not anticipate the present invention.

#### **Hardy (US 3,355,674)**

Hardy discloses an optical fiber laser device in which the laser element is an optical fiber surrounded by a cladding material. Cooling means are provided to effect efficient transfer of energy from a pumping source to the laser element, providing a laser whose output signal is monochromatic and highly directional.

With reference to Figures 1 and 2, column 3 lines 55-75, and column 4, lines 1-47, the laser device of Hardy is a laser element 10, comprised of a fiber core 26 and a layer of cladding 27. The laser device emits light to a lens 17, or may receive light from a lens 21 and emit to a lens 23. Examiner specifically refers to Figure 8 as showing anticipation of the present invention. However, Figure 8 merely depicts the latter arrangement of the device, where light from a light source 69 is focused by a lens 70 into a single fiber core 38, and emitted to a lens 71. Nowhere in the figures or discussion presented by Hardy is there an arrangement of optical fibers such as is provided by the present invention, i.e. at least one information transmission optical fiber jointed or contacted to at least one gradient index optical fiber, where the gradient index optical fiber has an outer diameter equal to that of the information transmission optical fiber and a length exhibiting a specific lens function. Applicant notes that the present invention as recited in claim 12 does not include a lens *per se* as described by Hardy, but an optical fiber that functions as a lens, i.e. a “lens function-including optical fiber”.

#### **Snitzer (US 3,395,331)**

Snitzer provides a device for converting the output of a laser to optical energy at a harmonic of the laser emission line. The device is depicted in Figure 1 which shows a conventional laser rod 10 in coaxial relation to an optical fiber 12. A cross sectional view of the optical fiber 12 is presented in Figure 2. Examiner has particularly referred to Figures 2 and 7. Applicant notes that there is no Figure 7 in Snitzer. However, with respect to Figure 2, what is depicted is a single optical fiber with a break in the center (the edges of which are “wavy” lines) to show that the fiber is of an unspecified length. Applicant further notes that a single fiber is portrayed. In Figure 1, the fiber is shown as receiving light from a lens 15, but there is no coupling of the fiber to a GRIN fiber of equal diameter with a lens function, as is provided by the present invention. Snitzer neither shows in this or any other figure, or discusses in the specification, a lens function-including optical fiber such as is provided by the present invention, and as is recited in claim 12.

In summary, Claim 12 recites a method of making a lens function-including optical fiber and such a method is not shown or suggested by Scobey et al., Hardy, or Snitzer. Thus, claim 12

is patentably distinct from the cited references.

In view of the foregoing, reconsideration and withdrawal of this rejection are respectfully requested.

### **35 U.S.C. 103(a) Rejection**

**Swanson et al.** Claims 1-3 and 8-10 stand rejected under 35 U.S.C. 103(a) as unpatentable over Swanson et al., (US 6,445,939).

Applicant has hereby amended claim 1 to recite the features of claim 4 of the application. Examiner has indicated that claim 4 is allowable. Therefore, claim 1 as amended should also be allowable, together with the claims that depend from claim 1 (2-3 and 8-10).

In view of the foregoing, reconsideration and withdrawal of this rejection are respectfully requested.

**Scobey et al.** Claim 11 stands rejected under 35 U.S.C. 103(a) as unpatentable over Scobey et al. (US 5,859,717). Examiner states that placing the single mode optical fiber affixed to a graded index mode optical fiber in a planar substrate with is V-shaped is shown by Scobey et al. in Figure 2 and columns 7-8. Applicant respectfully disagrees.

Claim 11 has hereby been amended to include the features of claim 1. The differences between the technology described by Scobey et al. and the present invention are described in detail above in the section responding to the 102(a) rejection. Briefly, Scobey et al. disclose two joined optical fibers that are not of the same diameter. In contrast, the present invention as recited in amended claim 11 discloses a lens function-including optical fiber, comprising: 1) at least one single mode information transmission optical fiber (SMF) and 2) at least one gradient index optical fiber (GIF), wherein the gradient index optical fiber has an outer diameter *equal* to that of the SMF. Scobey et al. neither show or suggest a lens function-including optical fiber with these two components having an equal diameter. Thus, the present invention is not rendered obvious by Scobey et al.

In view of the foregoing, reconsideration and withdrawal of this rejection are respectfully requested.

### **Abstract**

Examiner has required a new abstract of the disclosure, stating that the abstract "does not commence on a separate sheet". Applicant respectfully submits that in Applicant's copy of the application as filed, the abstract is presented on a separate sheet. Applicant encloses as Appendix I, a copy of the abstract as filed in this case.

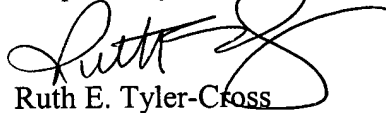
### **Formal Matters and Conclusion**

In view of the foregoing, Applicant submits that all rejections have been successfully traversed and that claims 1-23 should be deemed new and unobvious over the prior art of record. The Examiner is respectfully requested to reconsider and pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

Please charge any underpayment or credit any overpayment of fees to attorney's deposit account #50-2041.

Respectfully submitted,



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